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SOV/58-59-5-9916

On the Mechanism of Electron Capture Into Acceleration in a Betatron. I.

has terminated a revolution, completes a revolution in its turn. Calculations in this case show that, thanks to interaction among themselves, the electron beams "straighten out", i.e., tend to travel along the circumferences. The "straightened-out" beams may form a so-called equilibrium beam that determines the total quantity of captured electrons.

A.P. Fateyev

Card 2/2

SOV/58-59-5-9917

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, p 26 (USSR)

AUTHOR: Rodimov, B.N.

TITLE: On the Mechanism of Electron Capture Into Acceleration in a Betatron, II.

PERIODICAL: Izv. Tomskogo politekhn. in-ta, 1957, Vol 87, pp 30 - 40

ABSTRACT: Studying a very crude picture of band-electron-beam interaction, the author asserts that the quantity of electrons captured into acceleration is determined by a mechanism involving the formation of an equilibrium electron beam that circulates in the betatron chamber in the form of a closed, stable ring without any radial or axial oscillations. The results obtained on the basis of this assertion lead to a qualitative and quantitative understanding of capture regularities. For part I cf. abs. 9916

A.P. Fateyev

Card 1/1

RODIMOV, B. N.
AUTHOR:

TITLE:

PERIODICAL:

ABSTRACT:

RODIMOV, B. N.

On the Magnetic Field of a Betatron. (Zakonmernosti magnitnogo
polya betatrona, Russian)
Zhurnal Tekhn. fiz. 1957, Vol 27. Nr 6, pp 1330-1336 (U.S.S.R.)

57-6-27/36

First, the equation for the motion of an electron in the magnetic field of a betatron is deduced. It is shown that the distribution of the focusing forces in the field and the evaluation of the field quality from this point of view best results in the quantity V_M - the power function of the focusing forces of the magnetic field of the betatron.

The equation of the magnetic field of a betatron is then derived, which expresses the properties of the focusing field. The function V_M for an optimum field leads to the selection of the best electric circuit within range of the focusing forces. This takes place in consideration of the required intensity and of technical and economic factors.

In conclusion the solution of the equation is used for the computation of the betatron field with the required properties. (With 4 Illustrations and 1 Slavic Reference).

Card 1/2

On the Magnetic Field of a Betatron.

57-6-27/36

ASSOCIATION: Polytechnic Institute, Tomsk. (Politechnicheskiy institut,
Tomsk)
PRESENTED BY:
SUBMITTED: 3.12.1956
AVAILABLE: Library of Congress

Card 2/2

RODIMOV, B.N.; MEDVEDEVA, T.A.

Fixed field alternating gradient betatron. Izv. vys. ucheb.
zav.; fiz. no.4:147-157 '59. (MIRA 13:3)

1. Tomskiy politekhnicheskiy institut imeni S.M. Kirova.
(Betatron)

RODIMOV, B.N.; CHERDANTSEV, P.A.; MEDVEDEVA, T.A.

Creation of large currents in the betatron. Izv.vys.
ucheb.zav.; fiz. no.5:6-13 '59. (MIRA 13:4)

1. Tomskiy politekhnicheskii institut imeni S.M.Kirova.
(Betatron)

21(9)

AUTHOR:

Rodimov, B. N.

SOV/89-6-2-12/28

TITLE:

Stereotron- a Betatron With a Space Equilibrium Orbit (Stereotron - betatron s prostranstvennoy ravnovesnoy orbitoy)

PERIODICAL:

Atomnaya energiya, 1959, Vol 6, Nr 2, pp 200 - 202 (USSR)

ABSTRACT:

The stereotron is a variety of the betatron with a constant controlling field, in which the electrons to be accelerated enter a considerably stronger field without enlarging their radii, as soon as they are axially oriented. With a constant controlling field a sufficiently high frequency may be used for the feeding of the central leg coils. Furthermore, under acceleration conditions the electron capture is considerably higher than in the ordinary betatron. Thus an increase in the medium radiation intensity is brought about. In the stereotron the electron outlet from the chambers is easier. The control systems and the weight of the plant are much lower. The equation of motion of the electrons for such a device is deduced and the field intensities H_r , H_z required are calculated. A

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prototype of such a device is now being built for 10 Mev. and

Stereotron - a Betatron With a Space Equilibrium Orbit SOV/89-6-2-12/28

50 cycles. According to the development of stereotrons with controlling field it is possible to build a synchrotron with double electron feed. If 2 devices of that type are used, each of which is established on the opposite side of the accelerating field, the orbit directions of the electron rays and X-rays in the device are reverse or intersect each other. At present, another type of that device is investigated theoretically and from the engineering point of view. There are 3 figures.

ASSOCIATION: Tomskiy politekhnicheskii institut (Tomsk Polytechnic Institute)

SUBMITTED: October 9, 1958

Card 2/2

33970

S/089/62/012/003/008/013
B102/B108

24.6730

21.310

AUTHOR: Rodimov, B. N.

TITLE: Stereotron with "shuttle" focusing

PERIODICAL: Atomnaya energiya, v. 12, no. 3, 1962, 240 - 242

TEXT: In an earlier paper (Atomnaya energiya, 6, no. 2, 200 (1959)) the author presented the idea of a stereotron, a betatron with spatial equilibrium orbit. The control field is defocusing in the z-direction. Its components are

$$H_r = - \left(\frac{\partial H_z}{\partial z} \right)_{R, z_0} x + A \omega \xi;$$

(3)

$$H_z = H_z(R, z_0) + A \omega x + \left(\frac{\partial H_z}{\partial z} \right)_{R, z_0} \xi.$$

(Fig. 1). $x = r - R$, $\xi = z - z_0$. This field is focusing, if $n = -RA\omega/H_z(R, z_0)$ is positive for $\xi = 0$ and $x = 0$. For, e.g., $R = 15$ cm, $H_z = 10$ gauss and $n = 0.75$ the amplitude of the additional radial field, $H_r' = A \sin \omega \xi \sim A \omega \xi$,

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S/089/62/012/003/008/013
B102/B108

Stereotron with "shuttle" focusing

is given by $A\omega = -nH_z/R = -0.5$. In contrast to the usual betatron, the plane $z=z_0$, where H'_r is formed, is not a plane of symmetry. The points with $H_r = 0$ lie on a surface for which $-(\partial H_z/\partial z)_{R,z_0} x + A\omega \xi = 0$ (Fig. 2).

H'_r is produced by turns (Fig. 3). The necessary shift of the focusing region is achieved when for three-phase current three mutually displaced (along z-axis) systems of turns are used. The resulting traveling field is then

$$H_1 = H_m \sin \omega_0 t \sin \frac{2\pi z}{\lambda};$$

$$H_2 = H_m \sin \left(\omega_0 t - \frac{2}{3} \pi \right) \sin \left(\frac{2\pi z}{\lambda} - \frac{2}{3} \pi \right); \quad (6)$$

$$H_3 = H_m \sin \left(\omega_0 t + \frac{2}{3} \pi \right) \sin \left(\frac{2\pi z}{\lambda} + \frac{2}{3} \pi \right).$$

Its amplitude will be 3/2 of that of the one-phase field. During one period $T = 2\pi/\omega_0$ of the current the focusing region a-b (Fig. 3) is shifted by $\lambda = 2\pi/\omega$; λ of course depends on z . The frequency ω_0 of the three-phase supply current has to be higher than that (Ω) of the accelerating field:

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Stereotron with "shuttle" focusing

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$J_0 = 2N\Omega$, where N is the number of "waves" of H_z on $z_{\text{final}} - z_0$. There are 4 figures and 2 Soviet references.

SUBMITTED: May 3, 1961

Fig. 1. Stereotron control field.

Fig. 2. Stability region in the resulting magnetic field.

Fig. 3. System of turns for stationary focusing

Legend: (1) axis of apparatus; (2) vacuum chamber.

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RODIMOV, B.N.

Stereotron with "shuttle" focusing. Atom. energ. 12
no.3:240-242 Mr '62. (MIRA 15:2)
(Betatron)

RODIEV, B.N.; SOKOLOV, V.A., prof., red.

[Conjugate or auto-oscillation quantum mechanics and its relativistic foundations] Sopriazhennaia, ili avtokolebatel'-naia kvantovaia mekhanika i ee reliativistskie osnovy. Tomsk, Tomskii politekhn. in-t, 1965. 110 p. (MIRA 18:4)

RODIMOV, B.N.

New variant of an old physical problem. Izv. TPI 122:3-10 '62.
(MIRA 17:9)

1. Nauchno-issledovatel'skiy institut pri Tomskom ordena
Trudovogo Krasnogo Znameni politekhnicheskoye imeni
Kirova.

ACCESSION NR: AR4032166

S/0058/64/000/002/B002/B002

SOURCE: Ref. zh. Fiz., Abs. 2B19

AUTHOR: Rodimov, B. N.

TITLE: New variant of an old physics problem

CITED SOURCE: Izv. Tomskogo politekhn. in-ta, v. 122, 1962, 3-10

TOPIC TAGS: Schroedinger equation, group velocity, group velocity wave equation, v equation, hydrogen atom, quantum mechanics, particle wave properties

TRANSLATION: The first velocity u determines the wave properties of the particles described by a Schrodinger equation. It is suggested that the group velocity $v = c^2/u$ should also determine these wave properties and should also yield its own wave equation (the so-called v-equation). The author derives it in the form

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ACCESSION NR: AR4032166

$$\Delta\psi + [8^2 m E^2 / h^2 (E - V)] \psi = 0$$

The problem of the hydrogen atom is considered from the point of view of the v-equation, making it possible to construct a new physical picture of the hydrogen atom.

DATE ACQ: 31Mar64

SUB CODE: PH

ENCL: 00

Card 2/2

BUZANOV, S.P.; KARPOV, A.M.; RODIMOV, B.A., redaktor; VERINA, G.P.,
tekhnicheskiy redaktor.

[Planning and arrangement of railroad hump yards] Proektirovanie
sortirovochnykh gorok i polugorok i ikh ustroistvo. Moskva, Gos.
transp. shel-dor. izd-vo, 1954. 238 p. (MLBA 8:2)
(Railroads--Stations)

RODINOV, B.I.

✓ 11458 19
ON THE BETATRON MAGNETIC FIELD. B. I. Rodinov
(Tomsk Polytechnic Inst.) Zhur. Tekh. Fiz. 21, 1330-3
(1957) June. (In Russian)
Equations are developed for electron motion in a mag-
netic betatron field. An equation describing all the proper-
ties of the betatron focusing magnetic field was used in
calculations of betatron field with fixed properties. (R.V.J.)

1-pm
1-9mm

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3

RODIMOV, V.P., assistant

Balancing serial multicylinder automobile and tractor engines
in assembling after the overhaul. Izv. vys. ucheb. zav.;
mashinostr. no.2:98-105 '64. (MIRA 17:5)

1. Moskovskoye vysshaye tekhnicheskoye uchilishche imeni
Baumana.

RODILOV, V.P., assistant; GUREVICH, L.V., inzh.

Balancing of engines in assembly at the Automobile Repair Plant
No.4. Izv. vys. ucheb. zav.; mashinostr. no.3:100-102 '64.
(MIRA 17:7)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche
Imeni Bauman.

L 15195-66 EWP(v)/EWT(d)/EWP(k)/EWP(h)/EWP(1) WVH/GS

ACC NR: AT6001714

SOURCE CODE: UR/0000/65/000/000/0411/0418

AUTHOR: Rodimov, V. P.

ORG: none

TITLE: Dynamic balancing of assembled multicylinder in-line engines

SOURCE: Uravnovesivaniye mashin i priborov (Balancing of machinery and instruments). Moscow, Izd-vo Mashinostroyeniye, 1965, 411-418

TOPIC TAGS: rotor balancing, internal combustion engine, engine crankshaft, engine test facility, balancing machinery/ Moskvich-407 engine

ABSTRACT: The theory of balancing assembled multicylinder engines on a balancing machine developed at MVTU imeni Bauman is presented. The chosen configuration consists of a cast iron plate 1, connected to the base by four coil springs 2, damped by dashpots 3, and two electrodynamic seismic transducers 4 (see Fig. 1). Three equations of motion are derived in terms of the terminology in Fig. 1. The transducers provide signals (proportional to the unbalance) to an electronic network which eliminates the second and higher order harmonics. The differential equations were solved, and a set of equations relating the transducer outputs to the magnitudes and positions of the unbalances (in two planes) are presented as

$$d_1 \cos(\omega t + \lambda_1 - \varepsilon) \mu_{d1} = E_1 - v_1 E_{11} = E_{11}^*$$

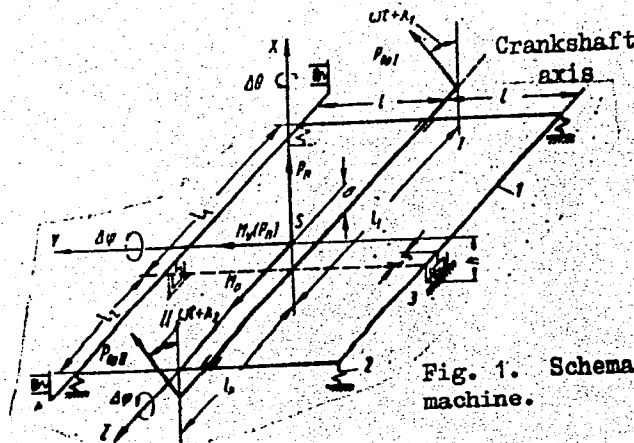
$$d_2 \cos(\omega t + \lambda_2 - \varepsilon) \mu_{d2} = E_{11} - v_2 E_1 = E_{11}^*$$

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ACC NR: AT6001714

2



(where μ_{d_1} , μ_{d_2} , ν_1 and ν_2 = constants for a given machine). By measuring the amplitudes and phases of the transducer outputs, the location and magnitude of the unbalances can be determined. The machine developed at MVTU imeni Bauman for the assembled engine⁹ of "Moskvich-407" has an angular accuracy of 5° and achieves final balancing to within 15 gcm in both planes (at 900 rpm). The machine has operated well under industrial conditions, proving that balancing of assembled engines is practical. Orig. art. has: 1 table, 2 figures, and 8 formulas.

Card 2/2

SUB CODE:

SUBM DATE: 04Sep65/ ORIG REF: 003

RODIMITSEV, A., general-polkovnik, dvazhdy Geroy Sovetskogo Soyuz

Through the years of battle. Voen. Znan. 41 no.5:3-4 My '65.
(MIRA 18:5)

RODIMSEV, A., general-leutenant, dvaindy geroy sovetskogo soyuza.

With a thought for the Motherland. Voen.vest. 39 no.2:17-21 F '60.
(MIA 14:2)

(Russia--Army)

USSR/Cultivated Plants - Commercial. Oil-Bearing. Sugar-Bearing. M-5
Abs Jour : Ref Zhur - Biol., No 7, 1958, 29888
Author : Molchanov, D.M., Lysenko, F.F., Rodimtsev, I.A., Rzhhevskiy,
G.K., Shafrin, A.N.
Inst : -
Title : Cotton Sowing Times in Uzbekistan.
Orig Pub : Sots. s. kh. Uzbekistana, 1957, No 3, 7-10
Abstract : No abstract.

Card 1/1

- 13 -

RODIN, A.

State plan of scientific research work. *Mias.ind.* SSSR 33 [i.e. 34] no. 2:
1-3 '68. (MIRA 16:4)

1. Gosudarstvennyy komitet po koordinatsii nauchno-issledovatel'skikh
rabot SSSR.

(Research, Industrial)

RODIN, A.

TECHNOLOGY

RODIN, A. New ways for generating electric powder. p. 26.

Vol. 5, no, 6, 1958

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 3
March 1959 Unclass

RODIN, Ante, inz.

Paletization and its importance in transport. Tehnicki pregled
13 no.3:89-93 '61.

RODIN, A.

"A contribution in recognition of an invention by Tesla." p. 219
(Nauka I Tehnika. Vol. 8, no. 4, Apr. 1952, Beograd.)

SO: Monthly List of East European Accessions, Vol. 3, No. 6, Library of Congress,
Feb. 1954, Uncl.

RODIN, A.

Tasks of science in solving important problems of the meat
industry. Mias.ind.SSSR 33 no.2:44-47 '62. (MIRA 15:5)

1. Gosudarstvennyy komitet Soveta Ministrov SSSR po koordinatsii
nauchno-issledovatel'skikh rabot.
(Meat industry) (Research, Industrial)

RODIN, A.

Modernization of the meat industry in the Moscow Province. Mias.
ind. SSSR 31 no. 3:36-37 '60. (MIRA 13:9)

1. Mosoblsovnarkhoz.
(Moscow Province--Meat industry)

RODIN, A.

For a further expansion of the meat industry in Turkmenistan.
Mias.ind.SSSR 27 no.1:34-36 '56. (MLRA 9:6)

1.Zamestitel' ministra promyshlennosti myasnykh i molechnykh
produktov Turkmenskoy SSR.
(Turkmenistan--Meat Industry)

RODIN, A.A., inzhener.

Experience of the foremost workers communicated to the masses.
Izobr. v SSSR. 1 no.2:36-37 A '56. (MIRA 10'3)
(Efficiency, Industrial)

PASS, L.G.; RODIN, A.F.; SLUTSKIY, M.B.; TOPOROV, P.T.; FEL'DMAN, L.S.;
VAL'DMAN, D.A.; TUKACHINSKIY, M.S.; YAKOVLEVA, T.V.; ISAKOV, V.I.,
red.; MORSKOY, K.L., red.izd-vs; BOROVNEV, N.K., tekhn.red.

[Organizing machine accounting in the construction industry;
collection of articles] Organizatsiia mekhanizirovannogo ucheta
v stroitel'stve; sbornik statei. Moskva, Gos.izd-vo lit-ry po
stroit., arkhitekt. i stroit.materialam, 1959. 171 p. (MIRA 13:3)
(Machine accounting)

RODIN, A.F.

In M.V.Lomonosov's native region. Vest. Mosk.un. Ser. 5: Geog.
16 no.5:68-69 S-0 '61. (MIRA 14:9)
(Lomonosovo (Kholmogory District)--Description)

RODIN, Aleksandr Feoktistovich.

RODIN, Aleksandr Feoktistovich.....Zavtra M_oskovskoi Oblasti. (moskva), Molodaia
gvardiia, 1932. 79 p.

DLC: HC337.M6R6

SO: LC, Soviet Geography, Part II, 1951/Unclassified

NR: AP7001342

SOURCE CODE: UR/0386/66/004/011/0461/0464 /

AUTHOR: Fridkin, V. M.; Gorelov, I. M.; Grekov, A. A.; Lyakhovitskaya, V. A.; Roĭin, A. I.

ORG: Institute of Crystallography, Academy of Sciences SSSR (Institut kristallografi Akademii nauk SSSR)

TITLE: Phase boundary in ferroelectric SbSI as the analog of an electric domain in a semiconductor

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 11, 1966, 461-464

TOPIC TAGS: semiconductor single crystal, antimony compound, ferroelectricity, domain boundary, phase boundary

ABSTRACT: This is a continuation of earlier work (Dokl. AN SSSR v. 169, no. 4, 810, 1966) where a new optic method of observing the phase transition in single-crystal SbSI was reported. The method was used in the present work to trace the motion of the phase boundaries in SbSI crystals grown from the gas phase in the form of needles (1 x 0.1 x 7 mm). The needle axis was the c axis of the crystal. The observation was made in transmitted light through parallel prismatic (100) faces in a direction perpendicular to the c axis. The tests showed that a constant electric field applied to the crystal causes the interphase boundary to move toward the cathode at a rate 10^{-3} cm/sec. Under certain experimental conditions (in the presence of a temperature gra-

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LC NR: AP7001342

dient in the absence of an external field), undamped oscillations of the interphase boundary were observed, accompanied by electric oscillations in the external circuit of the crystal. It is shown that the observed displacements are connected with motion of ferroelectric regions in the crystal, analogous to the motion of electric domains in a semiconductor. While this analogy does not fully determine the concrete mechanism or the direction of motion of the interphase boundary, it does provide an explanation for both the motion itself and its oscillations. It is also shown that the period of the oscillations agrees with the value that would follow from the Maxwell time constant for SbSI. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 09Sep66/ ORIG REF: 004/ OTH REF: 004

Card 2/2

GORBATOV, Vasilii Matveyevich; LAGOSHA, Ivan Andreyevich;
RODIN, A.I., retsenzent; PROZOROVSKIY, V.N., retsenzent;
LAPSHIN, A.A., spets. red.; KORBUT, L.V., red.;
NOZDRINA, V.A., red.

[Handbook of the equipment of meat industry enterprises]
Spravochnik po oborudovaniyu predpriatii miasnoi pro-
myshlennosti. Moskva, Pishchevaia promyshlennost'.
Vol. 1. 1965. 578 p. (MIRA 18:6)

GORBATOV, Vasiliy Matveyevich; LAGOSHA , Ivan Andreyevich; RODIN,
A.I., retsenzent; PROZOROVSKIY, V.N., retsenzent; LAPSHIN,
A.A., spets. red.; KORBUT, L.V., red.; NOZDRINA, V.A., red.

[Handbook on the equipment of meat industry enterprises]
Spravochnik po oborudovaniyu predpriyatii miasnoi promyshlen-
nosti. Moskva, Pishchevaia promyshlennost'. Vol.2. 1965.
546 p. (MIRA 18:5)

BEZRUK, Vasiliiy Makarovich; KOSTRIKO, Mikhail Tikhonovich; RODIN, A.I.
redaktor; KOGAN, F.L., tekhnicheskiiy redaktor.

[Geology and soil science] Geologiya i grunotovedenie. Moskva,
Nauchno-tekhn.izd-vo avtotransportnoi lit-ry, 1955. 326 p.
(Geology) (Soils(Engineering)) (MLRA 8:11)

ANDREYEV, Oleg Vladimirovich; BOLDAKOV, Yevgeniy Vasil'yevich;
GAYDUK, Kirill Vasil'yevich; KOSHELEV, Vyacheslav
Aleksandrovich; RODIN, Arkadiy Ivanovich; ROYER,
Yevgeniy Nikolayevich [deceased]; ~~GRIGOR'YEV, Ye.N.,~~
inzh., ~~retsensent~~; TRESKINSKIY, S.A., kand. geol.-mineral.
nauk, retsenzent; GLINKA, N.N., red.; KOVRIZHNYKH, L.P.,
red.izd-va; BODANOVA, A.P., tekhn. red.

[Concise manual on conduits and small bridges] ~~Praktik spravochnik~~
po trubam i malym mostam. [By] O.V.Andreev i dr. Izd.3.,
perer. Moskva, Avtotransizdat, 1963. 179 p. (MIRA 17:2)

RODIN, A.I.; GIL'BERG, L.A., redaktor; CHISTYAKOVA, A.V., tekhnicheskii redaktor.

[Silver soldering in the flame of a gas torch] Paika serebrianyimi
pripoiami v plameni gazovoi gorelki. Moskva, Gos. izd-vo oboronnoi
promyshlennosti, 1954. 53 p. (MLBA 8:2)
(Solder and soldering)

RODIN, A.I.
ANDREYEV, Oleg Vladimirovich; BOLDAKOV, Evgeniy Vasil'yevich; GAYDUK, Kirill Vasil'yevich; KOSHEV, Vyacheslav Aleksandrovich; RODIN, Arkadiy Ivanovich; ROYER, Evgeniy Nikolayevich; BOLDAKOV, Ye.V., doktor tekhnicheskikh nauk, redaktor; KUZNETSOV, I.A., redaktor; GALAKTIONOVA, Ye.N., tekhnicheskiiy redaktor.

[Concise handbook on conduits and small bridges; research and planning]
Kratkii spravochnik po trubam i malym mostam; izyskaniia i proektirovanie. Pod obshchei red. E.V.Boldakova. Izd.2-oe, perer. Moskva, Nauchno-tekhnicheskoe izd-vo avtotransp. lit-ry, 1956. 211 p. (MLRA 9:5)
(Bridges) (Pipes, Concrete)

RODIN, A. I.

Kratkiy Spravochnik Po Malym Mostam I Trubam; Izyskaniya I Proyektirovaniye
(Short Handbook on Small Bridges and Conduits; Research and Planning) Moskva,
Dorizdat, 1953.

224 P. Diagr., Tables.

At Head of Title: O. V. Andreyev, Ye. V. Boldakov, K. V. Gayduk, V. A. Koshelev,
A. I. Rodin, Ye. N. Royer.

SO: N/5
661.6
.B6

ANDREYEV, O.V.; BOLDAKOV, Ye.V., doktor tekhnicheskikh nauk;
GAYDUK, K.V.; KOSHELEV, V.A.; RODIN, A.I.; ROYER, Ye.N.

[Short handbook on small bridges and conduits; research and
planning] Kratkii spravochnik po malym mostam i trubam;
izyskaniia i proektirovanie. Moskva, Izd-vo dorozhno-tekhn.
lit-ry, 1953. 224 p. (MLRA 7:3)
(Bridges) (Pipe, Concrete)

RODIN, A.K.

Technical and economic indices for infrared gas heating. Gaz.
delo no.4:34-35 '65. (MIRA 18:6)

1. Saratovskiy gosudarstvennyy nauchno-issledovatel'skiy i
proyektnyy institut po ispol'zovaniyu gaza v narodnom
khozyaystve.

Rodin, A.M.

120-4-19/35

AUTHORS: Rodin, A.M. and Kuchay, S.A.

TITLE: Measurements of the Depth of Penetration and the Coefficient of Diffusion of a Gas in a Metal (Izmereniye glubiny proniknoveniya i koeffitsiyenta diffuzii gaza v metalle)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No.4, pp. 68 - 69 (USSR).

ABSTRACT: The surface layer of a metal disc can be saturated with any gas by positive ion bombardment in gas discharges, or devices similar to a mass-spectrometer (Ref. 1-5). It is of interest to determine the depth of penetration L of the gas into the body of the metal and also the coefficient of diffusion D of the given gas in the metal. The one-dimensional diffusion equation is solved assuming that the coefficient of diffusion does not depend on the co-ordinates and the gas concentration, and subject to simple boundary conditions. The above assumption applies in a number of cases (Le Claire and Rowe, Ref.6). There are 1 figure and 7 references, 2 of which are Slavic.

SUBMITTED: March 1, 1957.

AVAILABLE: Library of Congress

Card 1/1

RODIN, A.M.
AUTHORS: Kuchay, S. A., Rodin, A. M. 89-2-24/35
TITLE: The Electric Absorption of a Gas by a Metal with a Diffusing Surface (Elektricheskoye pogloshcheniye gaza metallom s raspilyayushcheyaya poverkhnost'yu).
PERIODICAL: Atomnaya Energiya, 1958, Nr 2, pp. 202-205 (USSR)
ABSTRACT: When certain metals are bombarded with gas-ions whose energies are in the order of magnitude of some 10 eV, an accumulation of gas-molecules is noticed in the metal. This is e.g. used in isotopic separation of inert gases. When no chemical interaction between the gas and the metal starts, it is justified to assume that the gas-concentration is determined by its isotropic diffusion from the source which lies somewhat deeper than the range of the ions. From this follows that after a long irradiation the absorbed gas would have to be observed in all metal-layers in comparable concentrations and that the entire quantity of gas would only be determined by the thickness of plate. It was experimentally determined, however, that this is not the case, but that the entire gas accumulated in a layer, the thickness of which approximately corresponds to the range of ions. This contradiction can be removed by assuming that the

Card 1/2

The Electric Absorption of a Gas by a Metal with a Diffusing Surface.

59-2-24/35

"electric absorption" is connected with a cathodic evaporation from the metal surface. On this assumption the electric absorption is theoretically calculated, where for the sake of simplicity the following assumptions are made:

- a) The ionic range in the metals is the same for all ions.
- b) The thickness of the metal plate is great.
- c) The diffusion coefficient is not dependent on the coordinates and the concentrations.

At first the solution of the diffusion equation is given and then the following cases are treated in particular:

- a) Steady distribution
- b) Transition process in the source plane.
- c) Gas concentration

There are 3 figures, 8 references, 2 of which are Slavic.

SUBMITTED: August 30, 1957

AVAILABLE: Library of Congress.

Card 2/2

1. Gases-Absorption Separation 2. Metals-Bombardment 3. Isotopes-

SOV/120-58-4-17/30

AUTHORS: Rodin, A. M., Vorob'yev, S. P. and Rodina, A. A.

TITLE: Measurement of the Amount of Deuterium Absorbed by Cathodes in a Gas Discharge (Izmereniye kolichestva deytteriya, pogloshchayemogo katodami, v gazovom razryade)

PERIODICAL: Priory i tekhnika eksperimenta, 1958, Nr 4, pp 78-82 (USSR)

ABSTRACT: It is well known that when metals are bombarded by ions the ions may penetrate into the body of the metal and accumulate in it. This method has been studied mainly in the case of penetration of ions of inert gases from the ion beams of mass separators (Refs 1-3). A similar effect of "electric absorption" of gas is observed at the cathodes of gas discharge tubes. A study of this effect is difficult because under the conditions of gas discharges various other processes are possible which lead to additional absorption (Refs 4-8). In the present paper the absorption of deuterium by the cathodes of a magnetic discharge manometer (Ref 9) is discussed. Deuterium has been used because it is rare, while hydrogen is contained in appreciable amounts in the majority of metals. The apparatus is illustrated diagrammatically in Fig 1. The apparatus consists of a glass chamber into which two plane cathodes (2) are placed. A ring anode is fixed

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SOV/120-58-4-17/30

Measurement of the Amount of Deuterium Absorbed by Cathodes in a Gas Discharge

half way between the cathodes. The assembly is placed between the poles of an electromagnet as shown in Fig.1. The cathodes are made of thin molybdenum and the material under investigation is attached to them in the form of thin plates 500 mm² in area. The ionisation current at a given voltage is varied by altering the pressure in the tube or by adjusting the magnetic field. The deuterium is admitted from a flask, 9. (Fig 1). The temperature of one of the cathodes is measured by means of a thermocouple. The deuterium absorbed by the cathodes is measured by heating the cathodes in a separate vacuum chamber and the emitted gas is analysed in a mass spectrum. Curves are given of the amount of deuterium absorbed by beryllium cathodes as a function of time, potential difference and ionisation current. Using this method, 10⁻⁸ g of deuterium may be detected with an accuracy of $\pm 5\%$ when the deuterium content is above 1 μg . L. Ye. Levina is

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SOV/120-58-4-17/30

Measurement of the Amount of Deuterium Absorbed by Cathodes in
a Gas Discharge

thanked for assistance in working out the method of mass
spectrum analysis. There are 6 figures, 1 table and
13 references, of which 6 are Soviet, 1 Swedish and 6
English.

SUBMITTED: September 15, 1957.

Card 3/3

KUCHAY, S.A.; RODIN, A.M.

"Electrical absorption" of gases by metals with sputtering surfaces.
Atom.energ. 4 no.2:202-205 F '58. (MIRA 11:4)
(Electron emission) (Ionization)

86743

S/120/60/000/006/018/045
E032/E314

6.4700

9.4110 (1003, 1105, 1140)

AUTHORS: Rodin, A.M. and Surenyants, V.V.

TITLE: The High-voltage, High-current Vacuum Discharge
Tube BNP-100 (VIR-100)

PERIODICAL: Pribery i tekhnika eksperimenta, 1960, No. 6,
pp. 62 - 65

TEXT: A vacuum spark discharge tube is described which can be used in the commutation of electrical circuits with pulsed currents of several thousand amperes at voltages up to 100 kV. The discharge tube (Fig. 1) is in the form of a glass envelope whose lower part contains two getters which are used to maintain the vacuum while the tube is in operation. The maximum diameter of the envelope is 80 mm and the length is 195 mm. The envelope is designed so that it can be placed in a container made of a dielectric and filled with transformer oil. The tube can also be operated in air, although at voltages in excess of 70 kV breakdown may occur. The main spark discharge takes place between the electrodes 1 and 2 which are made of molybdenum foils 1 mm thick. Molybdenum

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E032/E314

The High-voltage, High-current Vacuum Discharge Tube VIR-100 was chosen because of its low loss by evaporation under the action of the spark discharge. The evaporation of the electrode material is in fact the main limiting factor as far as the lifetime of the discharge tube is concerned. The electrode 2 covers the trigger system 3 and shields it from the effect of the main discharge. An aperture 3.5^{mm} in diameter is made in the electrode 2. This aperture is used to let through ionized gases after the triggering pulse is applied. A corresponding aperture is made in the trigger system which is shown on a larger scale on the right of Fig. 1. Its main parts are the electrodes 4 and 5 and the mica insulator 6. The electrode 4 is in the form of a zirconium foil, 40 μ thick, which is soldered to a tantalum disc through a layer of silver a few microns thick. After the soldering operation has been carried out the zirconium foil is saturated with hydrogen. The electrode 5 is in the form of a nickel cap having an aperture at its centre whose diameter is equal to the diameter of the apertures in the mica backing 6 and the electrode 2.

Card 2/5

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S/120/60/000/006/018/045
E032/E314

The High-voltage, High-current Vacuum Discharge Tube VIR-100

The trigger system is assembled on a ceramic insulator 7 with the ends of the cap 5 bent over the insulator so as to achieve a tightly fitting arrangement. The cap 5 is then welded to the electrode 2. The trigger discharge takes place through the mica layer between the electrodes 4 and 5 of the trigger system. The amplitude of the trigger pulse is 8 kV and the discharge is initiated, and has the same parameters, whatever the polarity of the triggering pulse. The electrical strength of the discharge tube, i.e. the magnitude of the static voltage for which spontaneous discharge takes place between 1 and 2 depends on the distance between the two electrodes. In the case of a 100 kV working voltage the distance between the electrodes was chosen to be 15 mm. The delay in the development of the main discharge depends on the polarity of the "stand-by" static voltage, the distance between the electrodes, the state of the surface of the high-voltage electrode, the construction of the trigger system and the amplitude of the triggering pulse. Some quantitative data on

X

Card 3/5

86743

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E032/E314

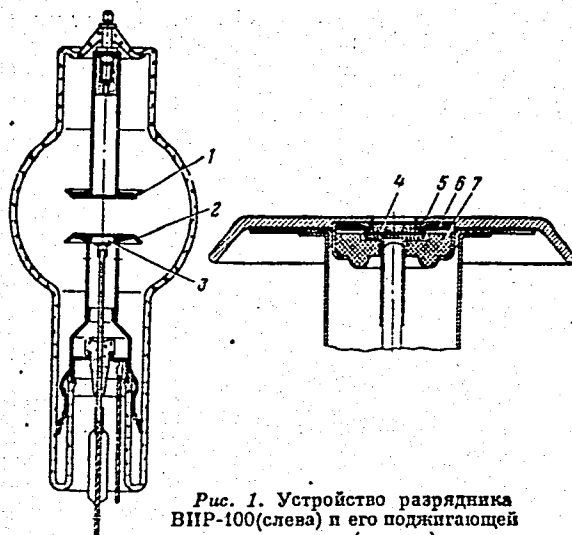
The High-voltage, High-current Vacuum Discharge Tube VIR-100
this delay are reported. The discharge tube has a lifetime of
500 single discharges for current amplitudes of up to 100 A.
At larger currents the lifetime is reduced owing to the
evaporation of the electrodematerial. For currents between
5 000 and 6000 A the limiting number of single discharges is up
to 100. There are 6 figures and 3 references: 2 Soviet
and 1 non-Soviet.

SUBMITTED: October 15, 1959

Card 4/5

86743
S/120/60/000/006/018/045
E032/E314

The High-voltage, High-current Vacuum Discharge Tube VIR-100
Fig. 1.



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Рис. 1. Устройство разрядника
ВНР-100(слева) и его поджигающей
системы (справа)

86747

213210 (2417, 1482, 1395)

S/120/60/000/006/022/045
E032/E314

AUTHORS: Koval'skiy, G.A. and Rodin, A.M.

TITLE: Separation of Isotopes of Inert Gases in an
Electromagnetic Isotope Separator

PERIODICAL: Priory i tekhnika eksperimenta, 1960, No. 6,
pp. 84 - 89

TEXT: Two methods of accumulation of gaseous elements after separation in an electromagnetic isotope separator are described. The first method is based on the embedding of ions in metallic targets and the second on pumping-off the required gas from a gas collector. The work was carried out between 1952 and 1955. Some preliminary results of this work were reported by Zolotarev et al (Ref. 6) during the Second Geneva Conference on the Peaceful Uses of Atomic Energy. The experiments were carried out with an electromagnetic 180° separator, having a gap of 35 cm and a base (source to detector distance) of 1 m. A hot-cathode arc-type ion source was employed. The arc chamber and the associated elements were kept at a high potential and the last electrode of the extracting system as well as the vacuum chamber of the

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86747
S/120/60/000/006/022/045
E032/E314

Separation of Isotopes of Inert Gases in an Electromagnetic Isotope Separator

separator and the detector were earthed. Ion optics of the bicylindrical type was used so that ion lines of any required height could be obtained. The source was supplied with gas through a regulated leak. Ion currents up to some tens of mA could be obtained. In the first method, the ions were embedded in nickel targets and the isotopic composition of the embedded material was investigated mass-spectrometrically by heating the target to 1 000 °C in a separate vacuum installation and collecting the emitted gas. Most of the experiments were carried out with neon and argon as the working gases. At low current densities ($0.1 \mu\text{A}/\text{cm}^2$) the amount of embedded gas increases linearly with time. At greater current densities a saturation state is reached after which the amount of embedded gas ceases to increase. The amount of gas which can be taken up by a nickel target under the saturation conditions is a roughly linear function of the ion energy (other things being equal) at least in the energy range 10 - 30 keV. Experimental evidence suggests that the ions

Card 2/4

X

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S/120/60/000/006/022/045

EO32/E314

Separation of Isotopes of Inert Gases in an Electromagnetic Isotope Separator

are embedded in the metal all the time but as the amount of embedded gas is increased the amount of gas re-emitted into the vacuum under the action of ion bombardment is also increased. In order to avoid periodic target changes, a special receiver was constructed in which the ion beams are received on a nickel ribbon which can be displaced by rotating two drums on which it is wound. By using the entire length of the ribbon enrichment factors exceeding 500 could be obtained. In addition to the method described above, inert-gas isotopes were also separated by pumping-off from receivers in which they were accumulated. This method has the advantage that no upper limit is imposed on the ion current entering the receivers. In these experiments the ion source had to be modified by inclusion of a reflecting cathode. The emitting cathode was set up close to the output slit of the source, whose dimensions were $100 \times 1.5 \text{ mm}^2$. The accelerating electrode was placed at a distance of 3 mm from it. The measured utilisation factor for argon and crypton

4

Card 3/4

86747

S/120/60/000/006/022/045

E052/E314

Separation of Isotopes of Inert Gases in an Electromagnetic Isotope Separator

in the separator was found to be 10 and 17%, respectively, while for neon it was found to be 7%. The input slits of the receivers had an area of 1.25 cm² (25 x 5 mm). Optimum results were obtained with current densities of 2-3 A/cm² and minimum possible pressures in the ion source. This refers to pure gases. For neon-air mixtures, the optimum current was greater by a factor of 2 - 2.5. The ions were received on graphite collectors. Neutralised atoms were pumped-off by an oil-diffusion pump. The results obtained indicate that the pumping method has definite advantages over the embedding method in the case of isotopes having an abundance greater than 1%. On the other hand, the other method is more useful in the case of low-abundance isotopes. There are 6 figures, 2 tables and 6 references: 3 English and 3 Soviet.

SUBMITTED: November 3, 1959

Card 4/4

RODIN, A. M.

82636

S/126/60/010/02/006/020

E111/E352

187530

AUTHORS:

Rodin, A.M. and Surenyants, V.V.

TITLE:

Diffusion Coefficient of Helium in Titanium

PERIODICAL:

Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 2, pp. 216 - 222

TEXT: The authors note the scarcity of data on diffusion coefficients of inert gases in metals, most of these data being obtained with relatively low inert-gas concentrations in the metal (Refs. 1-8). In the present work, 0.4 μ thick layers of titanium, previously saturated with H^3 to a stoichiometric ratio of about 1.8 were heated in vacuum. The titanium was deposited on 0.2 mm thick molybdenum discs by vacuum metallization and heated in an atmosphere of H^3 . Neither H^3 nor He^3 were evolved during three years' storage in vacuum at room temperature. H^3 was removed by vacuum heating and the disc was cut into pieces. A piece was placed in a special constant-volume vacuum heating apparatus (Fig. 1), the evolution of helium being followed by pressure measurement. Absence of appreciable quantities of other gases was checked with a type

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Diffusion Coefficient of Helium in Titanium

ISP-26 spectrograph, a discharge arrangement with a strong magnetic field being provided in the apparatus (Fig. 1). Experiments were carried out at 615, 650, 686 and 720 °C; at 615 °C helium evolution ceased in 3 hours, at 720 in 1.5, the amount evolved being within 5% of the calculated content in the specimen. A check experiment was carried out in which one side of the disc was exposed to vacuum and the other side to argon (Fig. 2): no evolution of helium into the vacuum occurred when the molybdenum side faced the vacuum. Experimental helium-evolution curves were compared with solutions of the Fick diffusion equation carried out by M.B. Nesvizhskiy for given initial and limiting conditions (Fig. 3). The two solutions are plotted in Fig. 4 (interrupted lines) together with experimental curves. Average values (logarithms) of the diffusion coefficients obtained by assuming the applicability of Fick's law and some other conditions are plotted against reciprocals of absolute temperature in Fig. 5. The corresponding equation is that the coefficient

Card 2/3
Acknowledgments are made to M.B. Nesvizhskiy for his assistance

$$D = 1.1 \times 10^{-9} e^{-1600/RT} \text{ cm}^2/\text{sec}.$$

82636

S/126/60/010/02/006/020

E111/E352

Diffusion Coefficient of Helium in Titanium

in the work.
There are 5 figures and 14 references, 6 of which are Soviet,
3 English, 1 French, 3 German and 1 international.

SUBMITTED: February 8, 1960

X

Card 3/3

GRUSHINA, V.V. (Moskva); RODIN, A.M. (Moskva); SAVITSKIY, Ye.M. (Moskva);
BURKHANOV, G.S. (Moskva)

Hydrogen sorption by Ti-Ni, Ti-Cr and Ti-Al alloys. Izv. AN SSSR.
Met. no.6:148-152 N-D '65. (MIRA 19:1)

1. Submitted September 14, 1965.

L 43100-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/HW/JG/JH

ACC NR: AP6014120

(N)

SOURCE CODE: UR/0370/65/000/006/0148/0152

AUTHORS: Grushina, V. V. (Moscow); Rodin, A. M. (Moscow); Burkhanov, G. S. (Moscow); Savitskiy, Ye. M. (Doctor of chemical sciences) (Moscow)

ORG: none

TITLE: Sorption of hydrogen by ^{v1}Ti-Ni, ^{v1}Ti-Cr, and ^{v1}Ti-Al alloys 49
B

SOURCE: AN SSSR. Izvestiya. Metally, no, 6, 1965, 148-152

TOPIC TAGS: titanium containing alloy, chromium containing alloy, aluminum containing alloy, hydrogen

ABSTRACT: The sorption of ^{v1}hydrogen by the titanium alloys: Ti-Ni (from 5 to 70 wt % Ni), Ti-Cr (from 4.3 to 78.5 wt % Cr), and Ti-Al (from 5-30 wt % Al) was studied. The investigation supplements the results of V. V. Grushina, and A. M. Rodin (Zh. fiz. khimii, 37, 1963, No. 3, 559). A schematic of the experimental apparatus is shown. The experimental results are presented graphically (see Fig. 1). It was found that the absorption of hydrogen by the alloys was strongly dependent on the nature of the solid solutions formed in the alloy. The liberation of hydrogen from hydrogenated titanium alloys at 200-1050C is more rapid than that from hydrogenated titanium.

Card 1/2

UDC: 669.295

L 43100-66

ACC NR: AP60L4120

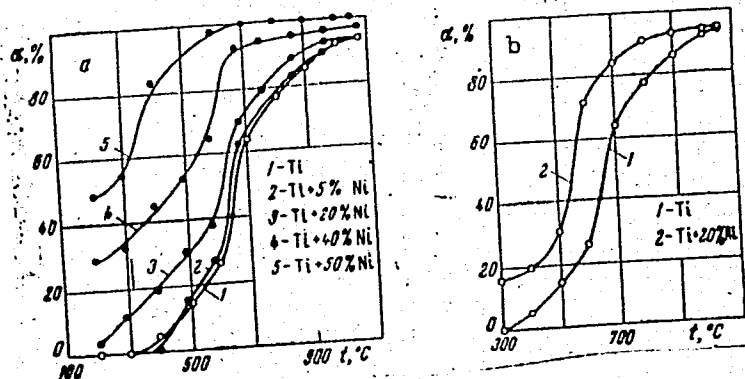


Fig. 1. Liberation of hydrogen from hydrogenated alloys Ti-Ni (a), nTi-Al (b), at different temperatures; α - ratio of the amount of liberated to absorbed hydrogen by the metal at a given temperature.

Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: 14Sep65/ ORIG REF: 008/ OTH REF: 009

Card 2/2 MLP

RODIN, A.

Reviews and bibliography. Mias.ind. SSSR 34 no.3:62 '63.

(MIRA 16:7)

1. Gosudarstvennyy komitet po koordinatsii nauchno-issledovatel'skikh
rabot SSSR.

GRUSHINA, V. V.; RODIN, A. M. (Moskva)

Sorption of hydrogen by titanium-zirconium and titanium-molybdenum alloys. Zhur. fiz. khim. 37 no. 3:559-565 Mr '63. (MIRA 17:5)

ACCESSION NR: AT4025310 S/0000/63/000/000/0199/0211

AUTHORS: Kozlov, O. V.; Rodin, A. M.; Rusanov, V. D.; Skoblo, Yu. A.; Chernetskiy, A. V.

TITLE: Plasma diagnostics by atom and ion beams

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey. Moscow, Gosatomizdat, 1963, 199-211

TOPIC TAGS: plasma interaction, discharge plasma, gas discharge, magnetic analysis, charge exchange, plasma research, ion beam, atom beam

ABSTRACT: Apparatus is described for the probing of a plasma of an oscillating discharge in gas by means of accelerated and focused ion beams or by means of charge-exchanged atom beams. Formulas are derived for the attenuation of ion beams in gases and are found to be in good agreement with experiments for the pairs $Ar^+ \rightarrow Ar$, $He^+ \rightarrow$

Card 1/5

ACCESSION NR: AT4025310

→ He, $H^+ \rightarrow H_2$, $He^+ \rightarrow Ar$ and others. The discrepancy between the experimental and calculated data becomes appreciable at high pressures. The limiting pressure amounted to $(2-3) \times 10^{15} \text{ cm}^{-2}$ for the pair $Ar^+ \rightarrow Ar$ with Ar^+ energy 10 keV and about 10^{16} cm^{-2} for the $H^+ \rightarrow H_2$ pair. Analogous results were obtained by measuring the broadening of the lines of the magnetic-analyzer spectrum. Measurements were also made of the dependence of the ion density on the discharge current. Apparatus was developed for the study of magnetosonic resonance and used to measure the attenuation of atomic argon beams in a hydrogen plasma, atomic helium beams in a helium plasma, and atomic argon beams in helium plasma. It is concluded that in spite of certain difficulties, the method of determining plasma parameters by means of beams of fast particles is worthy of serious attention, since it has undisputed advantages (practical elimination of contacts, locality of probing, wide range of measured quantities, and possibility of quantitative determination of the plasma composition). It is also concluded that atomic beams are

Cord 2/5

ACCESSION NR: AT4025310

more suitable for the determination of characteristics of charged particles. The operating speed of measurements with particle beams can be made quite high, with a low resolution time. Orig. art. has: 7 figures and 6 formulas.

ASSOCIATION: None

SUBMITTED: 19Oct63

SUB CODE: ME

DATE ACQ: 16Apr64

NR REF SOV: 004

ENCL: 02

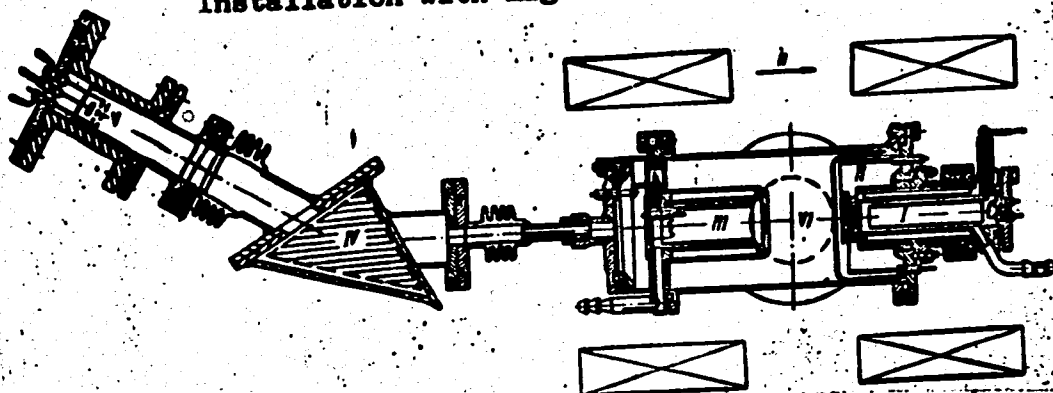
OTHER: 004

Card 3/5

ACCESSION NR: AT4025310

ENCLOSURE: 01

Installation with magnetic analyzer

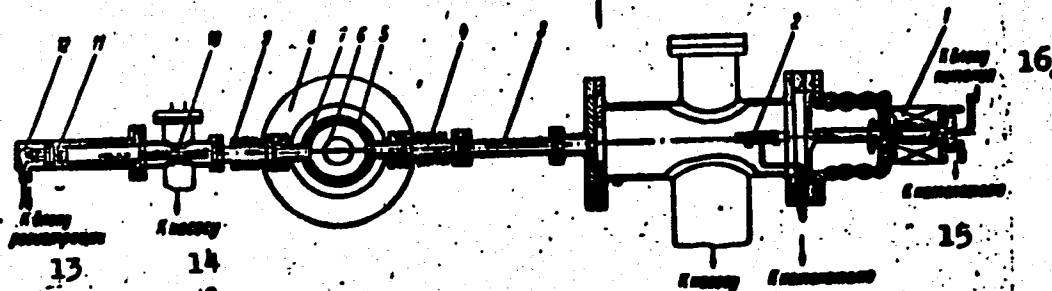


I - source, II - focusing electrode system,
III - gas discharge chamber, IV - magnetic analyzer
V - collector, VI - vacuum pump unit

Card 4/5

ACCESSSION NR: AT4025310

ENCLOSURE: 02



Sounding of a plasma with a high-frequency pulsed installation:

- 1 - ion source, 2 - charge exchange chamber, 3 - transition tube,
- 4 - bellows connection, 5 - gas discharge glass tube, 6 - plasma
- pinch, 7 - screen, 8 - magnetic core, 9 - bellows connection,
- 10 - deflecting plates, 11 - collector unit, 12 - cathode follower,
- 13 - to registration block, 14 - to pump, 15 - to leak valve,
- 16 - to supply block

Cord 5/5

L 23703-66 EWT(1)/EWT(m)/EWP(t) IJP(c) JD/JG

ACC NR: AT6006754

SOURCE CODE: UR/3158/65/000/015/0001/0018

AUTHOR: Bekmukhambetov, Ye. S.; Gus'kov, Yu. K.; Kasikov, I. I.; Lebedev, S. Ya.; Rodin, A. V.; Stakhanov, I. P. 73/81

ORG: Physics and Power Institute, State Committee on the Use of Atomic Energy, SSSR
(Fiziko-energeticheskiy institut, Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii SSSR)

TITLE: Operation of a ²¹cesium diode with ²¹inert-gas impurity

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 15, 1965. Rabota tseziyevogo dioda s primes'yu inertnogo gaza, 1-18

TOPIC TAGS: cesium electron tube, cesium plasma, thermoelectric convertor, volt ampere characteristic, pressure effect, temperature dependence, inert gas

ABSTRACT: The investigations were motivated by the fact that when a thermoelectric converter is operated in a nuclear reactor, the fission products, a large fraction of which are radioactive krypton and xenon, may enter in the interelectrode gap of the converter, and their effect on the converter in the operation of a cesium diode may be appreciable. The tests were made with experimental tubes with flat electrodes, using a molybdenum cathode and niobium anodes. Doubly distilled metallic cesium and spectrally pure krypton and xenon were used in varying amounts. The cathode was fed with pulsating halfwave current. The cesium vapor pressure ranged from 0.1 to 3.9 mm Hg for the krypton-filled tube and 0.028 to 2 mm Hg for the xenon-filled tube. Plots were prepared of the dependence of the short-circuit current on

Card 1/2

L 23703-66

ACC NR: AT 6006754

the cathode temperature without and with the inert gases, and volt-ampere characteristics at various pressures. The introduction of the inert gases resulted in a parallel shift of the temperature dependence curves towards smaller currents, and to noticeable reduction in the output parameters of the converter. Comparison of the experimental results with calculations based on diffusion theory show in general good agreement, although some unexplained irregularities were observed in that the saturation current following addition of xenon was higher than following addition of krypton, and that the experimental currents usually were lower than the theoretical ones. These deviations are related to thermal diffusion separation of the cesium-krypton and cesium-xenon mixtures in the tube. The experiments show that addition of inert gases reduces the saturation current compared with pure cesium. The experimental saturation currents were as a rule lower than the theoretical ones by a factor 2--4. Addition of krypton reduced the saturation current more than addition of xenon. The thermal diffusion ratios were calculated for Cs-Kr and Cs-Xe mixtures in the case of low cesium densities. The values obtained for the cross sections of the interaction between cesium and xenon and krypton are 1.05×10^{-13} and $8 \times 10^{-14} \text{ cm}^2$, respectively. Direct experiments on the thermal diffusion in the mixtures of cesium and inert gases are necessary for a final interpretation of the results.

Orig. art. has: 12 figures and 12 formulas.

SUB CODE: 20/1 ORIG REF: 004/ OTH REF: 002

SUBM DATE: none

Card 2/2 *fw*

S/076/63/037/003/006/020
B101/B215

AUTHORS: Grushina, V. V., Rodin, A. M. (Moscow)

TITLE: Hydrogen sorption by titanium - zirconium and titanium - molybdenum alloys

PERIODICAL: Zhurnal fizicheskoy khimii, v. 37, no. 3, 1963, 559-565

TEXT: Sorption of hydrogen by Ti - Zr and Ti - Mo alloys was conducted at $p_{H_2} = 5$ mm Hg to $p_{H_2} = 60$ atm at room temperature by heating to 800°C and cooling to room temperature. The amount of adsorbed hydrogen was determined by measuring the p_{H_2} after the alloy had been heated to 1100°C in vacuo. Results: (1) The amount of absorbed H_2 in Ti - Zr alloys decreases continuously from 455 cm^3 per gram metal in pure Ti to 236 cm^3 per gram in pure Zr as the zirconium content of the alloy increases. The number of H atoms dissolved in the alloy per metal atom remains constant (~ 1.9). (2) The number of H atoms on sorption of H_2

Card 1/2

Hydrogen sorption by titanium - ...

S/076/63/037/003/006/020...
B101/B215

in Ti - Mo alloys is ~1.9 per metal atom up to a molybdenum content of 50% and becomes zero when the Mo content increases to 80%. For 50% Mo, the ratio H : Ti is 2.8. (3) Hydrogen is easily adsorbed by Ti - Mo alloys at room temperature and pure surfaces. Sorption is delayed by adding an inert gas to H₂, and inhibited by air. (4) The thermal stability of structures consisting of hydrogen and Ti - Mo or Ti - Zr is lower than that of structures of hydrogen and pure titanium. There are 7 figures and 2 tables.

SUBMITTED: November 28, 1961

Card 2/2

POPOV, V.M., prof., doktor tekhn. nauk; RODIN, A.N., inzh.; BATANOGOV,
A.P., inzh.; ETINGOV, S.I., inzh.

Performance of automatic fans and heating equipment at Northern
Ural bauxite mines. Gor. zhur. no.4:48-52 Ap '65. (MIRA 18:5)

1. Vsesoyuznyy zaochnyy politekhnicheskiiy institut, Moskva (for
Popov, Rodin, Batanogov). 2. Severoural'skiye boksitovyye rudniki
(for Etingov).

RODIN, A.N.; DOBRYNIN, L.M.

Remote control of fans and heaters in the Severouralsk bauxite
mines. Gor.zhur. no.8:43-47 Ag '65.

(MIRA 18:10)

1. Vsesoyuznyy zaochnyy politekhnicheskiiy institut (for Rodin).
2. Konstruktorskoye byuro TSvetmetavtomatika (for Dobrynin).

REF ID: A6888
 FORESTRY: Forestry. Forest Cultures.
 ABS. JOUR: Ref Zhur-Biologiya, No. 5, 1959, No. 20166
 AUTHOR: Rodin, A.B.
 TITLE: The Effect of Forest Cultures on Snow Cover, Soil Freezing and Thawing.

ORIG. PUB.: Nauchn. dokl. vyssh. shkoly. Leningrad, 1958, No. 2, 10-13

ABSTRACT: A study was made in 19-20 year old 140 m wide forest strips located around Uchinskii reservoir in Moskovskaya Oblast to determine the effect of forests of various composition on the snow cover, and soil freezing and thawing during the winters of 1955/56 and 1956/57 in comparison with a field. It was established that in deciduous stands the snow cover was distributed uniformly, while in stands with an admixture of conifers (especially spruce) the snow

CLRO: 1/3

REF ID: A6888
 FORESTRY: Forestry. Forest Cultures.
 ABS. JOUR: Ref Zhur-Biologiya, No. 5, 1959, No. 20166

AUTHOR:
 INST.:
 TITLE:

ORIG. PUB.:

ABSTRACT: deposit was uneven and the unevenness became stronger in those places where there was more spruce in the composition. Soil freezing on the field was stronger in 1956 by 1.7 - 3.6 times, in 1957 by 2.1 - 2 times as compared with the forest plantings. Soil thawing in the woods took place 2-14 days earlier than on the field. The duration of snow melting in the forest plantings took 5-13 days longer than on the field. Participation of spruce in the

CLRO: 2/3

RODIN, A. R.: Master Agric Sci (diss) -- "Investigation of forest crops along the banks of the Ucha reservoir". Moscow, 1959. 18 pp (Min Higher Educ USSR, Moscow Forestry Engineering Inst) (KL, No 17, 1959, 110)

BORODIN, Aleksandr Mikhaylovich; RODIN, Anatoliy Rodionovich;
ROSTOVTSEV, S.A., red.; CHUGUNOVA, Z.S., red. izd-va;
VDOVINA, V.M., tekhn. red.

[Manual for workers in forest plantations] Spravochnik rabo-
chego po lesnym kul'turam. Moskva, Goslesbumizdat, 1962. 131 p.
(MIRA 16:2)

(Forests and forestry)

L 45166-66 EWT(1)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI IJP(c) RTW/TT/JD/WW/JG/AT
 ACC NR: AP6028623 SOURCE CODE: UR/0057/66/036/008/1481/1488

AUTHOR: Bel'mukhambetov, Ye. S.; Gus'kov, Yu. K.; Kasikov, I. I.; Lebedev, S. Ya.
 Stakhanov, I. P.; Rodin, A. V.

ORG: none

TITLE: Operation of a cesium thermoelectric converter in the presence of an inert gas

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 8, 1966, 1481-1488

TOPIC TAGS: thermionic energy conversion, cesium, electric arc, cesium plasma, inert gas, neon, argon, krypton, xenon

ABSTRACT: The authors have investigated the effect of the presence of Ne, Ar, Kr, and Xe on the operation of a cesium arc in the 0.5 to 1.0 mm gap between a hot molybdenum foil cathode and a niobium anode. The apparatus was sealed off at 10^{-7} mm Hg after having been cleansed by the usual vacuum techniques. The cesium pressure was controlled by varying the temperature of a branch tube containing metallic cesium, the temperature of the remainder of the apparatus being kept 30 to 50° C higher. The inert gas was admitted in successive doses by breaking tubes containing it. The cesium pressure was varied from 0.0275 to 3.9 mm Hg, and inert gas pressures up to 234 mm Hg were investigated. Very small additions of inert gas increased the plateau of the current-voltage characteristic by some 0.1 V, but further increase of the inert gas pressure led to deterioration of the characteristics of the converter.

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The presence of the inert gas decreased the saturation current. The saturation current under different conditions was calculated with the aid of the diffusion theory of B.Ya.Moyzhes and G.Ye.Pikus (FTT, 2, 756, 1960), and the results are compared with the measured values. The measured saturation currents were usually from 2 to 10 times lower than the calculated currents. This is ascribed to increase of the inert gas concentration in the hot region between the electrodes as a result of thermal diffusion of the inert gas cesium mixture. Xenon reduced the saturation current less than did neon or krypton; this is ascribed to the fact that the atomic mass of xenon is closer than that of neon or krypton to the atomic mass of cesium. A formula is derived for the thermal diffusion ratio, and with the aid of this formula and the assumption that the observed deviations from the moyzhes-Pikus theory are due to thermal diffusion, values of the Kr-Cs and Xe-Cs cross sections were calculated from the experimental data. The Kr-Cs and Xe-Cs cross sections were thus found to be 8×10^{-14} and $1.05 \times 10^{-13} \text{ cm}^2$, respectively. The authors thank S.I.Kutashev and V.I.Klinov for assistance in constructing the apparatus and performing the measurements. Orig. art. [15]
has: 11 formulas, 6 figures and 3 tables.

SUB CODE: 20
ATD PRESS: 5081

SUBM DATE: 23Aug65

ORIG. REF: 002

OTH REF: 004/

Card 2/2 *amm*

RODIN, B., inzh.

Experimental plant for making lightweight materials of clay.

Stroi. mat. 4 no. 4:38-39 Ap '58.
(Kiev--Clay industries)

(MIRA 11:5)

RODIN, B.I., inzh.

New heatproof friction material for construction and road machines.
Stroi. i dor. mash. 6 no.2:15-16 F '61. (MIRA 14:5)
(Building machinery)
(Road machinery)

RODIN, B.I., kand. ekonom. nauk

Investigating the efficiency of the use of plastics in automobile
manufacture. Avt. prom. 30 no.12:28-31 D '64. (MIRA 18:2)

1. Moskovskiy institut elektronnoy mashinostroyeniya.

L 24722-65 EWT(d)/EWT(m)/EPF(c)/EWP(c)/EWA(d)/EWP(v)/EPR/EWP(j)/T/EWP(t)/EWP(k)/
EWP(b)/EWP(1) Pc-4/Pf-4/Pr-4/Ps-4 JD/WV/RM

AM5004014

BOOK EXPLOITATION

Leykin, Abram Yefimovich; Poroykiy, Efroim Solomonovich; Rodin, Boris Iosifovich

Aircraft material science (Aviatsionnoye materialovedeniye) Moscow, Izd-vo "Mashino-
stroyeniye", 1964. 458 p. illus., biblio. Errata slip inserted. 8500 copies
printed.

TOPIC TAGS: aircraft material, aircraft nonmetallic materials, ferrous metal
material, sintered material

PURPOSE AND COVERAGE: This textbook is intended for students at tekhnikums. It
may also be useful to technicians of the aircraft industry. The book reviews
basic characteristics of the most important metallic and nonmetallic materials
used in aircraft structures. Methods of investigating alloy properties, flaw
detection, heat treatment, thermochemical treatment, and corrosion prevention are
described. The authors express their thanks to Docent K.P. Romadin and Candidates
of Technical Sciences A. I. Samokhotkiy and N.K. Zol'mikova.

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SUB CODE: MM, MT

SUBMITTED: 14Sep64

NO REF SOV: 011

OTHER: 002

Card 5/5

RODIN, B.I., kand.ekonom.nauk; KULESHOV, M.S., nauchnyy red.; LOGINOVA, R.A., red.; POLYANSKAYA, Z.P., tekhn.red.

[Technical and economic problems in the introduction of new materials to the machinery industry] Tekhniko-ekonomicheskie problemy vnedrenia novykh materialov v mashinostroenie. Moskva, 1963. 109 p. (Moscow. Tsentral'nyi institut nauchno-tekhnicheskoi informatsii po avtomatizatsii i mashinostroeniiu. Seriya: Ekonomika i spetsializatsiia mashi-
nstroeniia. Organizatsiia proizvodstva, no.81). (MIRA 16:12)

S/123/61/000/016/021/022
A004/A101

AUTHOR: Rodin, B.I.

TITLE: New heat-resistant friction material for building and road-building machines

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 16, 1961, 3, abstract 16Ts10 ("Stroit. i dor. mashiny", 1961, no. 2, 15 - 16)

TEXT: The new material "retinax" pertains to the asbestos-fiber phenolaldehyde plastics. As a binder, phenolformaldehyde resins of the resol-type are used (25%), asbestos is used as filler (40%), while barite is a powdery constituent (35%). The heat resistance of this material in a couple with cast iron is 700-800°C, the compression strength limit amounts to 1,300 kg/cm², water absorption in the course of 24 hours is 1%. The material does not burn, is not subjected to corrosion and resistant to the effects of fuel and oil. The service life of brake parts made of this material increases by a factor of 10-13 for excavators, 4-7 for automobiles and by a factor of 6-7 for winches. ✓

A. Sazonov

[Abstracter's note: Complete translation]

Card 1/1

S/081/62/000/005/102/112
B166/B101

AUTHOR: Rodin, B. I.

TITLE: A new heat-resistant friction material for building machines
and automotive vehicles

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 609, abstract
5P47 (Stroit. i dor. mashiny, no. 2, 1961, 15-16)

TEXT: A description is given of a new asbestos-fiber phenolic plastic
called retinax; its physicochemical properties are compared with those
of the old friction material type 6KX-1 (6KKh-1). It is shown that the
new heat-resistant friction material is very economical, and shows great
promise for building machines and automotive vehicles. [Abstracter's
note: Complete translation.]

Card 1/1

S/081/62/000/008/048/057
B166/B161

AUTHOR: Redin, B. I.

TITLE: A study of the technical and economic efficiency of a new synthetic material for motor vehicle construction

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 8, 1962, 554, abstract
6P44 (Avtomob. prom-st', no. 5, 1961, 29 - 32)

TEXT: On calculating the technical and economic efficiency of using a new heat-resisting friction material, type FK-24A (FK-24A), based on modified phenolformaldehyde resin (25%), asbestos (40%) and barite (35%), in the production of friction components for motor vehicles, it was found that considerable saving could be effected by introducing this material into the national economy (reduction of necessary capital investment by a factor of 1.65, of specific capital investments by a factor of 6.4, of running costs by a factor of 2.68 and so on). [Abstracter's note: Complete translation.]

Card 1/1

RODIN, B.I.

Studying the technical and economic advantages of new synthetic materials in automobile manufacture. Avt. prom. 27 no. 5:29-32 My '61. (MIRA 14:5)

1. Institut mashinovedeniya AN SSSR.
(Automobiles--Design and construction)
(Synthetic products)